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*Operation*

# BUSTER - JANGLE

NEVADA PROVING GROUNDS

OCTOBER - NOVEMBER 1954

Project 10.6

THE MEASUREMENT OF GAMMA-RAY  
INTENSITY VS TIME

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**THE MEASUREMENT OF GAMMA-RAY  
INTENSITY VS TIME**  
**Operation Buster-Jangle**

by

JOHN S. MALIK

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Los Alamos Scientific Laboratory  
Los Alamos, New Mexico

June 1952

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Table 1—SUMMARY OF DATA

Test	Range, yd	Radchem yield, kt	N <sub>2</sub> capture						Fission fragments				Total integral, r (including 8% for early γ)	Film badge dose, r
			τ, msec		Source intensity (× 10 <sup>25</sup> γ/cm <sup>2</sup> /sec)		I <sub>0</sub> , r/sec	Integral, r	Source intensity (× 10 <sup>23</sup> γ/cm <sup>2</sup> /sec)		Integral, r			
			Calculated	Measured	Calculated	Measured			Calculated	Measured				
Buster														
C	610	14.0	73	72	0.68	1.26	76,000	6,000	14.0	10.0	13,000	20,600	20,000	
C	1,100	14.0	73	66	0.68	1.4	8,000	530	14.0	9.0	900	1,550	1,350	
E	635	31.4		57	1.6	2.4	115,000	8,000	31.4	11.4	10,000	19,500		
E	1,040	31.4		68	1.6	2.2	40,000	2,900	31.4	18.2	3,300	7,000	8,000	
Jangle														
F	500	1.2							1.2	0.74	2,000	2,000		2,200

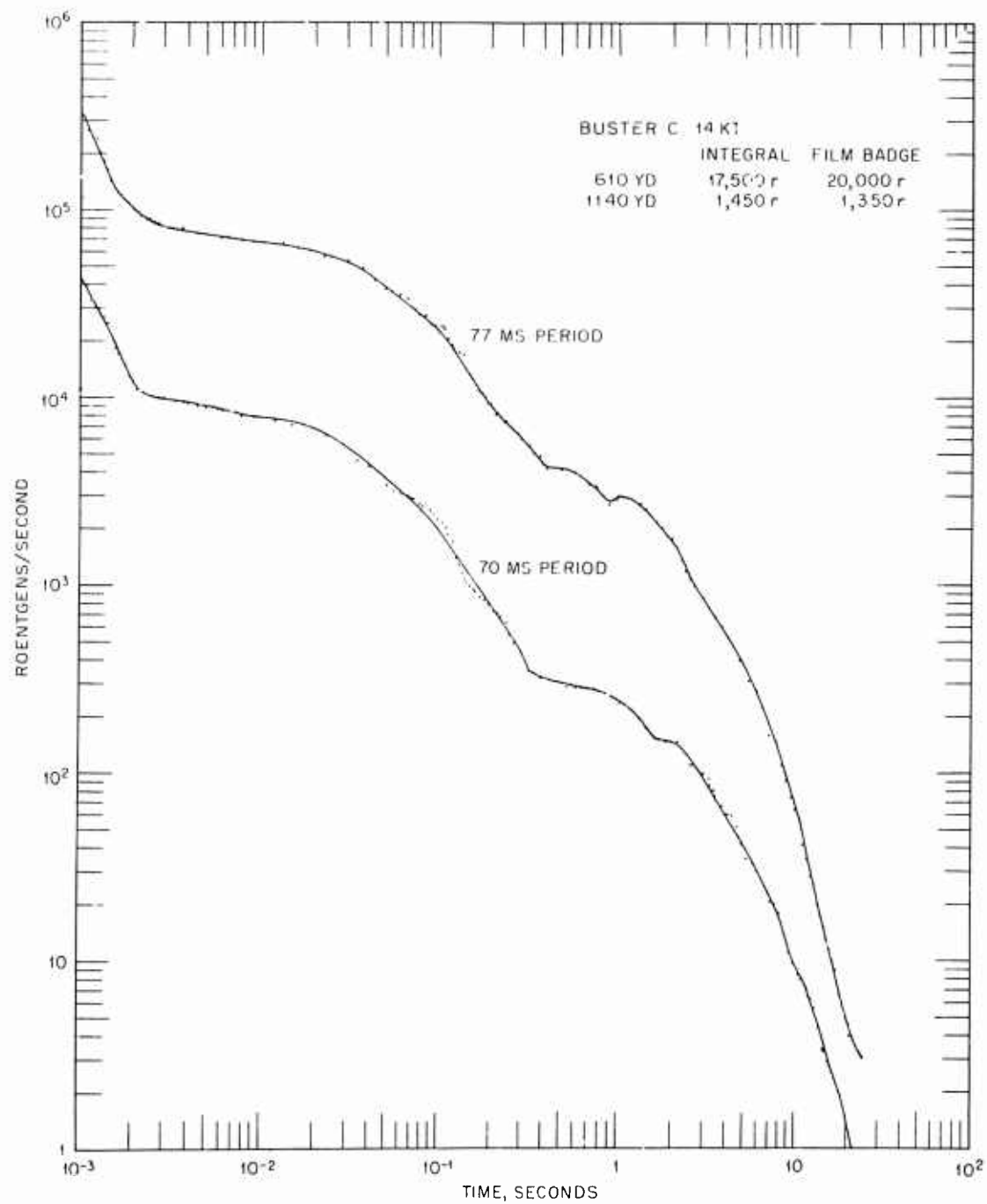


Fig. 11—Gamma intensity vs time, Buster C.

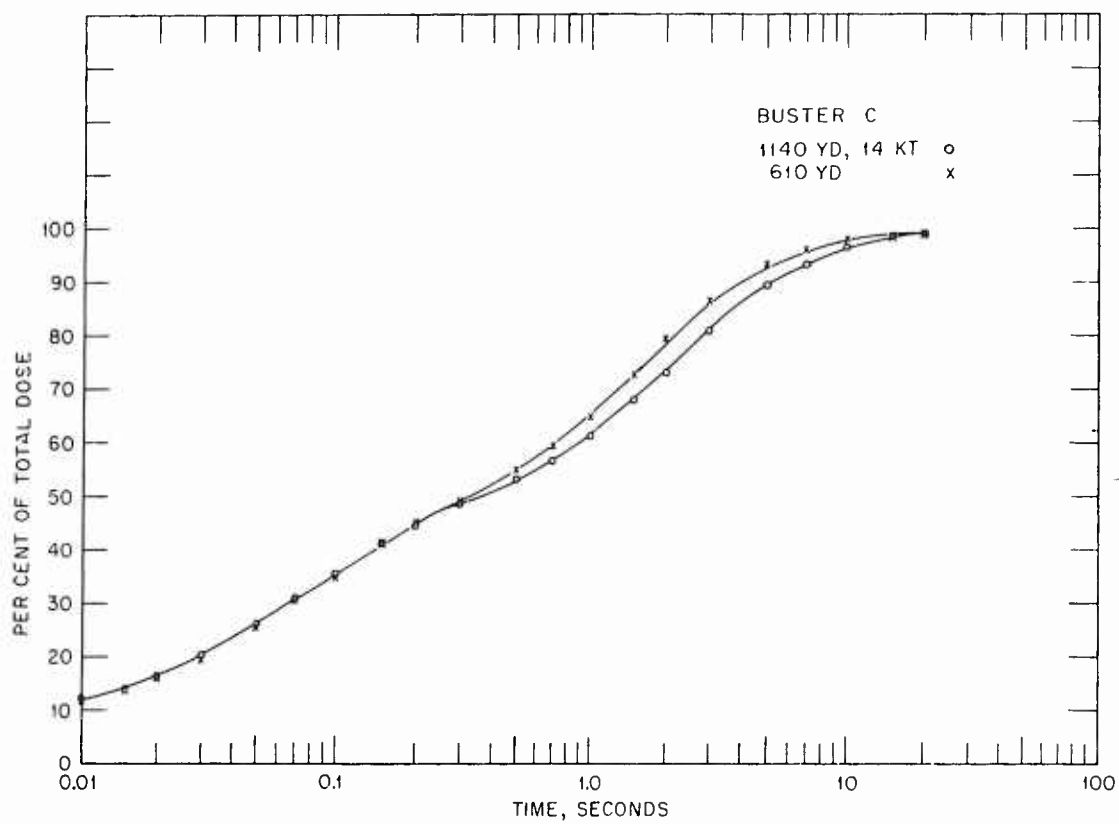


Fig. 12—Integral of curve of Fig. 11.

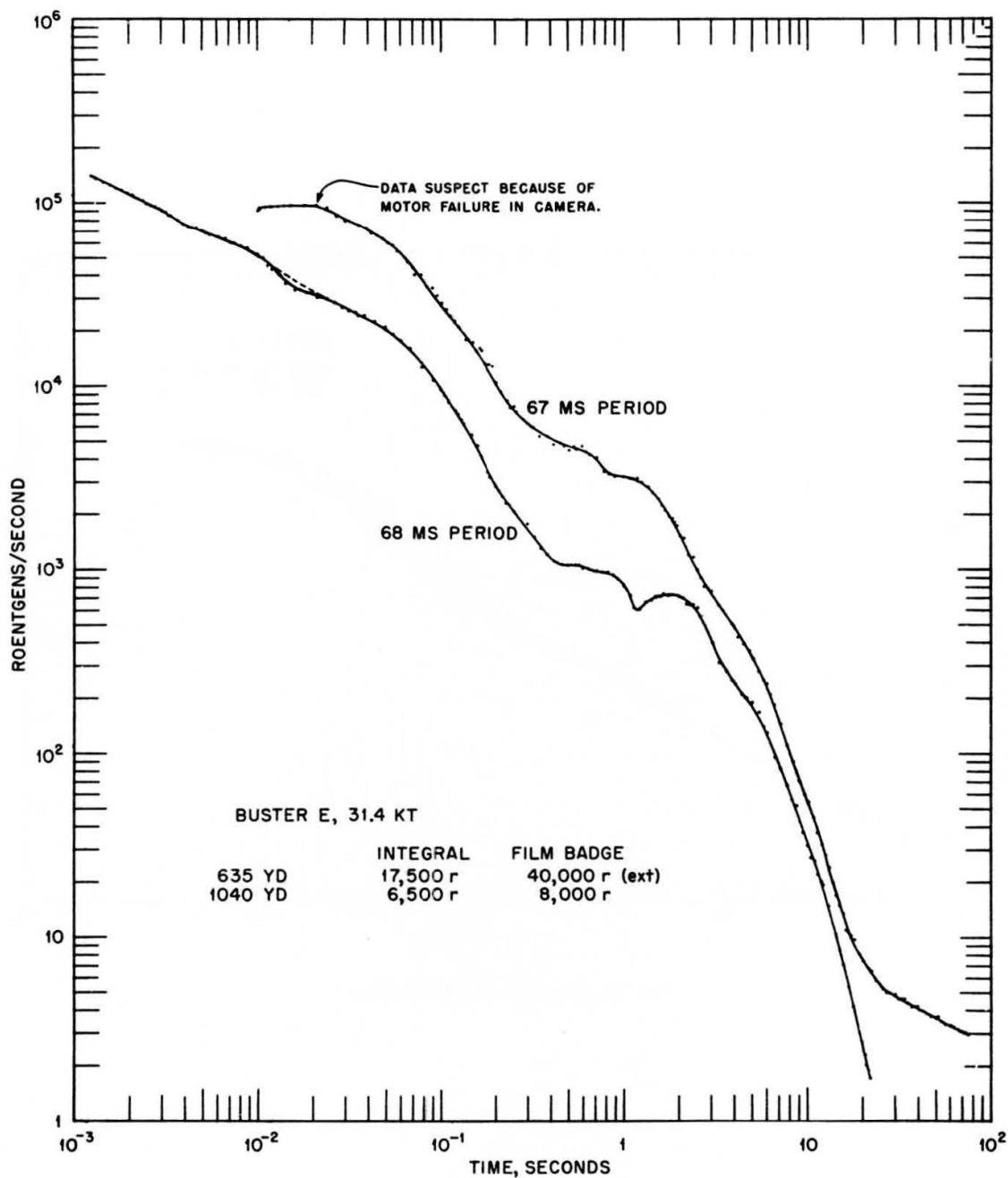


Fig. 13—Gamma intensity vs time, Buster E.

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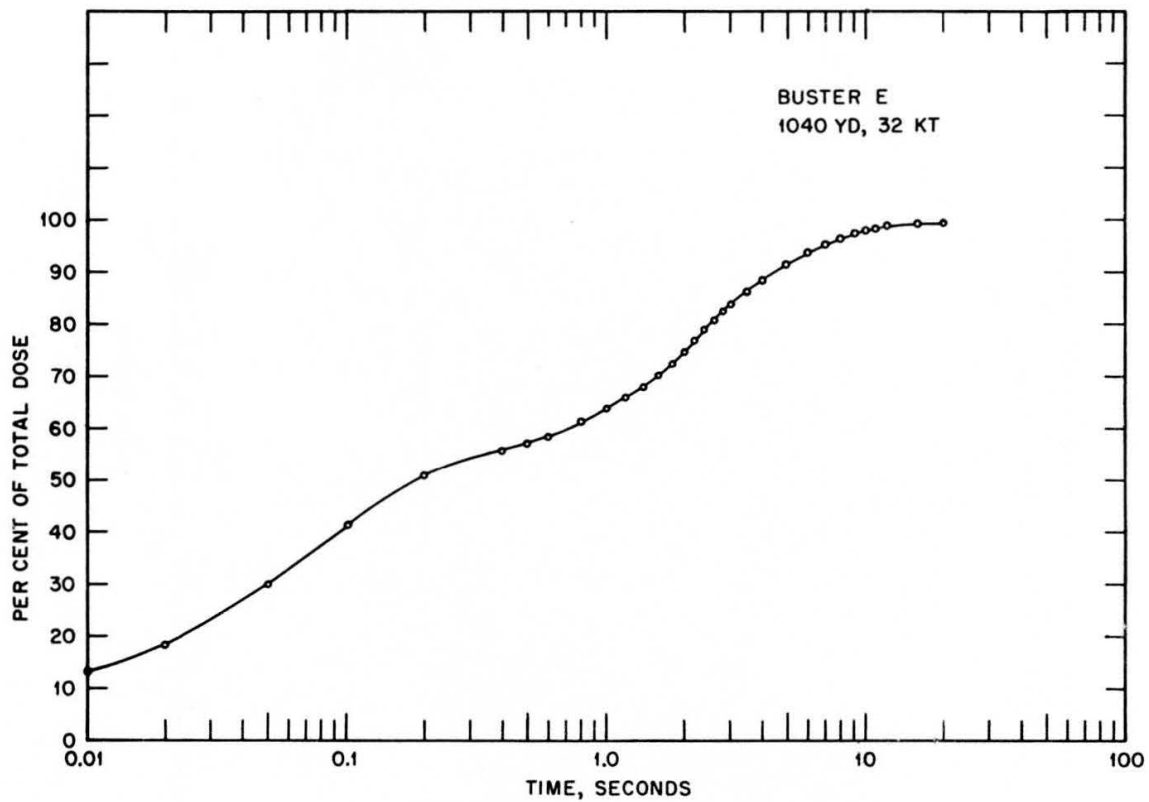


Fig. 14—Integral of curve of Fig. 13.



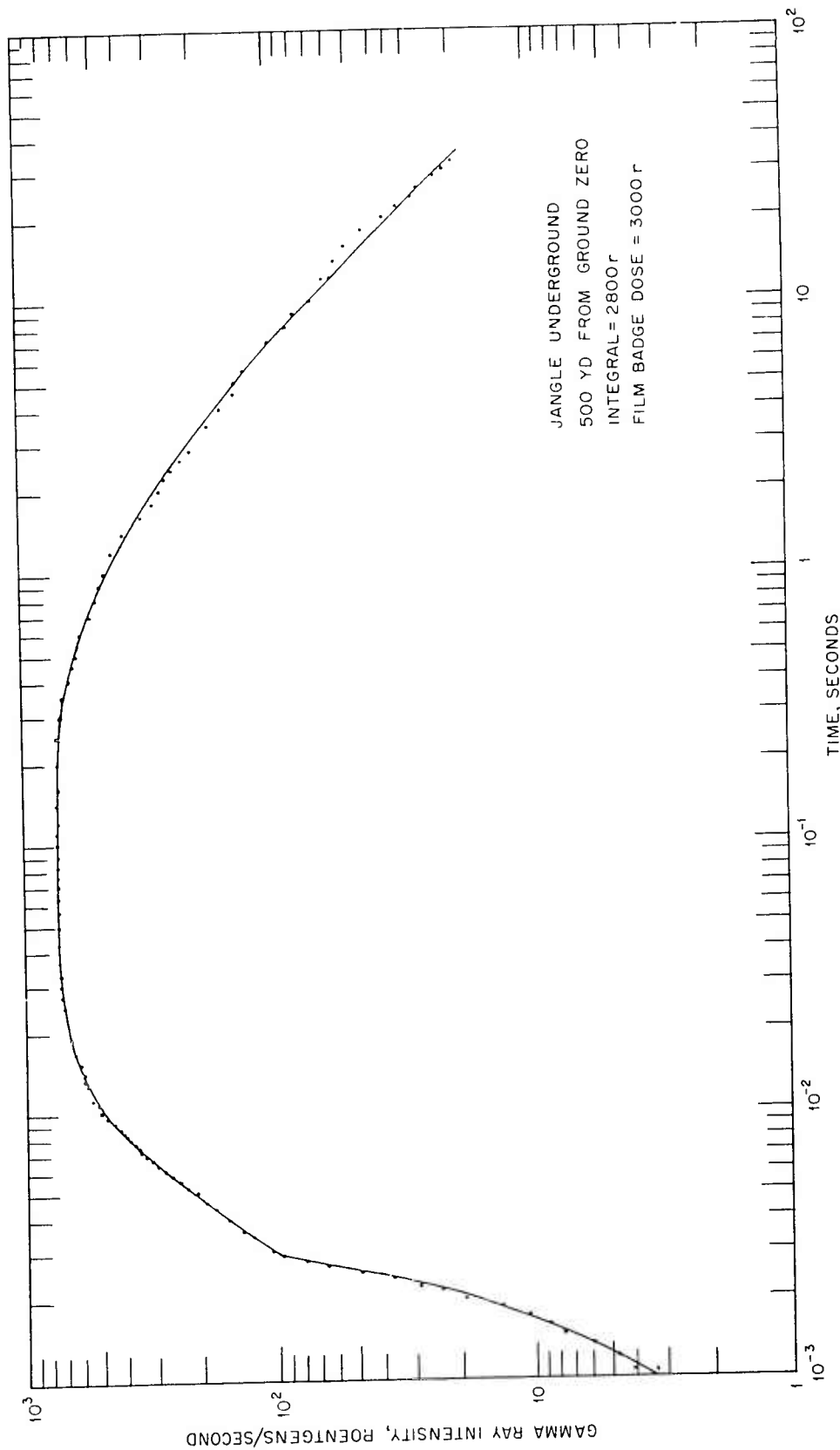


Fig. 15—Gamma intensity vs time, Jangle F.



## APPENDIX B

# SHIELDING MEASUREMENTS

The results of film-badge measurements at the stations are tabulated below. Station 961 was about 600 yd from ground zero, and Station 962 was about 1100 yd. The results show a shielding factor in dirt of about 6 in. per factor of  $e$  for the sandbag shielding and an inverse  $r^2$  shielding for the pipe, assuming a uniform "brightness" at the top of the culvert.

Table B.1—SHIELDING MEASUREMENTS, BAKER TEST

Measurement	Dose, r	
	Station 961	Station 962
Total dose	5500	400
In conduit (under some 1.5 ft of dirt)	170	16
Top of 18-in. culvert	27	<10
At middle of cable (about 4 ft below top of culvert)	2.6	0.16*
On top of recording can (about 8 ft below top of culvert)	0.8	0.16
At camera	0.11	0.16

\* The dose received on the film at this point was probably all due to exposure during recovery, since data from this station were recovered first and the dose received by the recovery party was more than this.

Table B.2—SHIELDING MEASUREMENTS, DOG TEST

Measurement	Dose, r
Total dose	$\sim 2 \times 10^4$
In conduit (under some 1.5 ft of dirt)	1200
At electronics box (under some 2.5 ft of sandbags)	>300
At top of 18-in. culvert	140
1.5 ft below top of culvert	58
3 ft below top of culvert	11
5.0 ft below top of culvert	5.2
7 ft below top of culvert	2.0
At relay shelf in recording unit (8.5 ft below top)	1.1
At camera	0.3